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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,552	12/08/2003	W. Allen Gilchrist	584-35673-US	1482
24923	7590	06/13/2006	EXAMINER	
PAUL S MADAN MADAN, MOSSMAN & SRIRAM, PC 2603 AUGUSTA, SUITE 700 HOUSTON, TX 77057-1130			MALEVIC, DJURA	
			ART UNIT	PAPER NUMBER
			2884	

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/730,552

Applicant(s)

GILCHRIST ET AL.

Examiner

Djura Malevic

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 29-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 11-16 and 29-34 is/are rejected.
- 7) ☒ Claim(s) 7-10 and 17-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06/10/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Response to Amendment***

The Amendment was entered.

**Response to Arguments**

Applicant's arguments with respect to claims 1 and 11 have been considered but are moot in view of the new ground(s) of rejection.

**Claim Objections**

Claim 20 is objected to because of the following informalities:

"The method of claim 19" should be "The apparatus of claim 19".

Appropriate correction is required.

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Randall et al. (Time Derived Sigma For Pulsed Neutron Capture Logging, 1981).

With regards to claim 1, Randall discloses a method for estimating a parameter of interest of an earth formation comprising: activating the nuclear radiation source; defining a start time for a processing time window wherein the measurement is responsive primarily to the parameter of interest; defining a start and end time based on previous or first measurement in which the measurement is "substantially" uncontaminated by noise; and analyzing the measurements within the processing time

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window for estimating the parameter of interest (Page 346 – 347, Sigma-Determined Positioning of Single 900 $\mu$ sec Gate). Note, Randall discloses that the second measurement is fixed (600 $\mu$ s) which depends upon the first measurement for statistical accuracy of the measurement, thus “broadly speaking” eliminating excess noise. The examiner further notes that the start time changes due to previous measurements, resulting in a change in the end time, since the window is fixed at 600 $\mu$ s.

With regards to claim 2, Randall discloses a first measurement that observes the decay rate (measurement that has a predetermined relationship to an estimated value of a parameter of interest) and adjusting the start and end processing time of the second measurement from the first measurement: (Page 346 – 347, Sigma-Determined Positioning of Single 900 $\mu$ sec Gate).

With regards to claim 3, Randall discloses pulsed neutrons (Abstract).

With regards to claim 4, Randall discloses measurements comprising gamma rays.

With regards to claim 5, Randall discloses the parameter to interest as thermal neutron capture cross section of the earth formation (Abstract).

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11 – 16 and 29 – 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gray et al. (Us Patent 4,668,863) in view of Randall et al. (Time Derived Sigma For Pulsed Neutron Capture Logging, 1981).

With regards to claim 11, Gray discloses an apparatus (Figure 1) for use within a borehole for estimating a parameter of interest of earth formation comprising: a nuclear radiation source 18 irradiating the earth formation and a nuclear radiation detector 14 & 16 spaced apart for said nuclear radiation source. However, Gray does not expressly disclose a processor that defines a starting time for a processing time window at which measurements made by the nuclear radiation detector are responsive primarily to the parameter of interest and processes the measurements to determine an ending time for the processing time window at which the measurements mad by the nuclear radiation detector are substantially uncontaminated by noise. Randall teaches a processor for estimating a parameter of interest of an earth formation (Page 346 – 347, Sigma-Determined Positioning of Signal 900 $\mu$ sec Gate) comprising: defining a start time for a processing time window wherein the measurement is responsive primarily to the parameter of interest; defining a start and end time based on previous or first measurement in which the measurement is “substantially” uncontaminated by noise; and analyzing the measurements within the processing time window for estimating the parameter of interest. Note, Randall discloses that the second measurement is fixed (600 $\mu$ s) which depends upon the first measurement for statistical accuracy of the measurement, thus “broadly speaking” eliminating excess noise. The examiner further

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notes that the start time changes due to previous measurements, resulting in a chance in the end time, since the window is fixed at  $600\mu\text{s}$ .

Thus, it would have been obvious to a person of ordinary skill in the art to at the time the invention was made to modify Gray to include the processor such as taught by Randall in order to improve accuracy and repeatability of the measurement of a parameter of interest of earth formation (Conclusion).

With regards to claim 12, Randall discloses a first measurement that observes the decay rate (measurement that has a predetermined relationship to an estimated value of a parameter of interest) and adjusting the start and end processing time of the second measurement from the first measurement (Page 346 – 347, Sigma-Determined Positioning of Single  $900\mu\text{sec}$  Gate).

With regards to claim 13, Randall discloses computing the thermal neutron capture cross section of an earth formation.

With regards to claim 14, Gray discloses a pulsed neutron source 18 (Figure 1).

With regards to claim 15, Randall discloses measurements comprising gamma rays (Abstract).

With regards to claim 16, Randall discloses the parameter of interest as thermal neutron capture cross section of the earth formation (Abstract).

With regards to claim 29 and 30, Gray discloses a wireline 20 as the conveyance device (Figure 1).

With regards to claim 31, Gray discloses a channel number generator 26 (Figure 1).

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With regards to claim 32, Gray discloses a mass storage unit 44 associated with the processor (Figure 1).

With regards to claim 33, Gray discloses a spectrum accumulator 28 (Figure 1).

With regards to claim 34, Gray discloses a depth controller 36 (Figure 1).

**Allowable Subject Matter**

Claims 7 – 10 and 17 – 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 7 and 17 address the relationship between the parameter of interest at start and end time of the processing window, wherein the relationship is  $istr = K/\Sigma$  where  $istr$  is the start time of the window,  $K$  is a constant and  $\Sigma$  is the capture cross section at ending time of said time window from an earlier pulsing of the radiation source. The prior art of record is silent with regards to this relationship ( $istr = K/\Sigma$ ), in combination with the rest of the claim limitations. As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art of record.

With regards to claims 8 and 18, the prior art on record does not suggest or render obvious a step of determining the ending time of the processing window further comprises forming a running sum of count rates starting at the starting time, in combination with the rest of the claim limitations. As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art of record.

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With regards to claim 10, the prior art on record does not suggest or render obvious a step of partitioning the processing time window into a plurality of channels having a length depending upon the starting time. As such, applicant's disclosure provides a novel and nonobvious improvement over the prior art of record.

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Djura Malevic whose telephone number is 571.272.5975. The examiner can normally be reached on Monday - Friday between 8:30am and 4:00pm.




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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**Djura Malevic**  
**Patent Examiner**  
**Art Unit 2884**  
**571.272.5975**

  
**DAVID PORTA**  
**SUPERVISOR**  
**EXAMINER**  
**TECHNICAL STAFF 2800**

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